

**REMARKS**

Claims 4-7, 9-17 and 19-28 are pending in this application. By this Amendment, claims 4, 9-14, 20 and 26 are amended, and claims 27-28 are added. No new matter is added. Reconsideration in view of the foregoing amendments and the following remarks is respectfully requested.

**I. The Pending Claims Define Patentable Subject Matter**

A. The Office Action rejects claims 4-7, 9-17, 19 and 21-25 under 35 U.S.C. §102(b) over PCT/JP99/01611 to Chikahisa et al. (Chikahisa). This rejection is respectfully traversed.

Claim 4 is amended for better clarity and recites, *inter alia*, that the screw pump includes a stationary screw that is non-rotatable, and a rotatable pump housing which accommodates the stationary screw and which is rotatable about the axis of the stationary screw. Claim 4 further recites that the screw pump is operable to deliver the fluid from the delivery nozzle, by rotation of the rotatable pump housing about the axis of the stationary screw, and that the pump drive device is operable to rotate the rotatable pump housing about the axis of the stationary screw to deliver the fluid from the delivery nozzle.

First, Chikahisa fails to teach or suggest a screw pump constructed as recited in amended claim 4. Described in detail, the apparatus disclosed in this reference uses a rotating discharge shaft 2121, the lower end portion of which is formed as a screw in the form of screw portion 2122, as described on page 18, lines 17-18. The screw 2122, which is rotatable with the shaft 2121, is inserted in pump housing 2111, and is rotated by rotation of the shaft 2121, as described in the paragraph bridging pages 19 and 20. Thus, the screw 2122 is not a stationary screw, but a rotatable screw. Adhesive 251 is discharged from the nozzle 2101 when the discharge shaft 2121 is rotated by discharge shaft-rotating device 2131, as described on page 38, in particular, lines 10-14.

The apparatus of amended claim 4 wherein the inner stationary screw is accommodated within the outer pump housing that is rotatable about the axis of the stationary screw to deliver the fluid has significant advantages over the apparatus of the reference wherein the inner screw 2122 is rotated relative to the outer pump housing 2111 to deliver the fluid. Namely, it is desirable to shorten the length of a supply passage between a supply portion of a fluid container of the fluid supply passage between a supply portion of a fluid container of the fluid supply device and the screw, for improving the accuracy of control of the amount of the fluid mass delivered from the delivery nozzle. In this respect, the screw pump wherein the pump housing disposed outwardly of the stationary screw is arranged to be rotated to deliver the fluid, as recited in claim 4, is advantageous for reducing the length of the above-indicated fluid passage, which assures improved accuracy of control of the amount of delivery of the fluid mass from the delivery nozzle, without a need of rotating the container together with the screw, since the outer pump housing is rotated about the inner stationary screw. Where the screw pump uses an inner rotatable screw which is rotated relative to an outer stationary pump housing to deliver the fluid, as in the apparatus of Chikahisa, it is not desirable to fix the rotatable screw to the container of the fluid supply device, since the rotation of the container with the screw is not desirable.

The Office Action points out that Chikahisa teaches that the same results may be obtained when the adhesive application member 2111 is rotated alone while the discharge shaft 2121 is stopped. However, Applicants respectfully submit that Chikahisa does not teach or suggest the stationary screw of the claimed invention for the following reasons.

Chikahisa teaches that the adhesive application member 2111 is rotated together with the discharge shaft 2121 (and thus, screw 2122), to change the position of the nozzle stopper 2114 (page 33, lines 10-13), so as to prevent the adhesive 251 from being discharged from one end 2101a of the nozzle (page 33, lines 24-25). In other words, the adhesive application

member 2111 is taught to be rotated for preventing the nozzle stopper 2114 from interfering with the wiring pattern on the circuit board 250, or for applying the adhesive 251 at more points, i.e., the multipoint application. This rotation of the adhesive application member 2111 is effected together with the rotation of the discharge shaft 2121 (page 43, lines 20-24), so that the adhesive 251 is prevented from being discharged out from the nozzle 2121. See, also, lines 1-23, page 18 of the Amendment filed October 17, 2003.

Therefore, in Chikahisa, even if the screw 2122 is suggested to be "stationary" for a period of time and the adhesive application member 2111 is rotated instead, the screw 2122 must also be made rotatable to effect the above-described operation. As such, when read as a whole, screw 2122 is taught to be rotatable, not fixed, even though for some operations it may not rotate. Accordingly, the screw 2122 is not non-rotatable.

For the reasons described above, Applicants respectfully submit that claim 4 is neither anticipated by, nor would have been obvious over Chikahisa. As such, withdrawal of this rejection is respectfully requested.

Claims 5-7, 9, 15-17 and 19-25 are allowable at least for their dependency on allowable base claim 4, as well as for the features they recite. In particular, Chikahisa does not teach or suggest the feature of claims 9, wherein the stationary screw is fixed to and coaxial with the supply portion. The Response to Arguments section of the Office Action refers to Figs. 3 and 4 of the present application. In this respect, the Examiner's attention is directed to the fact that claim 9 is not directed to this embodiment of Figs. 3 and 4, but is directed to the embodiment of Fig. 21 in which the stationary screw is fixed to the supply portion of the stationary container. The Chikahisa reference clearly describes that the screw 2122 is integral with one end portion of the discharge shaft 2121 (page 18, lines 17-18), that is not fixed to the any portion of the fluid supply device or syringe 2153.

Claim 11 is now rewritten in independent form and incorporates all the limitations of amended claim 4, and further recites (1) that the stationary screw is fixed to and coaxial with the supply portion of the stationary container of the fluid supply device, and (2) that the stationary screw is fitted into the rotatable pump housing as the container is mounted on the machine frame, and is removed from the rotatable pump housing as the stationary container is removed from the machine frame.

In addition to the above, Chikahisa fails to teach or suggest that the screw 2122 is fitted into the pump housing 2111 as the syringe 2153 is mounted on the machine frame and is removed from the pump housing as the syringe 2153 is removed from the machine frame.

The reference clearly describes that the screw portion 2122 is formed integrally with the lower end portion of the discharge shaft 2121 (page 18, lines 71-18), and is rotated in the screw insertion hole 2113 of the pump housing 2111 (page 19, lines 20-22). It is clear that the screw portion 2122 cannot be removed from the pump housing 2111 (Fig. 2) as the syringe 2153 (Fig. 1) is removed from the machine frame. It will be understood from the description in the first half of the paragraph bridging pages 18 and 19, that the removal of the syringe 2153 does not automatically cause the removal of the screw 2122 from the machine frame. That is, the removal of the screw 2122 from the machine frames requires (a) removal of member 2111a from the pump housing 2111, (b) removal of the pump housing 2111 from the spline shaft 2135, and (c) removal of rotation connection shaft 2134 from the end portion 2121a of the discharge shaft 2121. Thus, the removal of the rotatable screw 2122 from the machine frame requires a cumbersome procedure, and cannot be achieved by merely removing the fluid supply device 2153 from the machine frame. Similarly, the mere mounting of the fluid supply device 2153 does not cause the screw 2122 to be mounted in the pump housing 2111.

The limitation included in amended claim 11 permits significant reduction of the length of the fluid passage and consequent improvement of the accuracy of control of the amount of delivery of the fluid from the nozzle. This reduction is achieved owing to the arrangement of the screw pump in which the stationary screw is coaxially fixed to the supply portion of the stationary container of the fluid supply device. In the apparatus of Chikahisa, wherein the screw 2122 is not coaxial with the supply portion of the fluid supply device 2153, the dimension of the apparatus in the radial direction of the screw 2122, and the required length of the fluid passage, tend to be large. Thus, there is not such an advantage of the reduction of length.

Further, the screw pump including the inner stationary screw (604) accommodated in the outer rotatable pump housing (606) and coaxially fixed to the supply portion (614) of the fluid container (600) permits easy mounting and removal of the screw on and from the machine frame of the apparatus.

B. The Office Action rejects claim 26 under 35 U.S.C. §102(b) over U.S. Patent No. 5,046,666 to Ono. This rejection is moot, since claim 26 is now amended to depend from claim 4.

Claim 26 is allowable at least for its dependence on claim 4. Withdrawal of this rejection is respectfully requested.

C. The Office Action rejects claim 20 under 35 U.S.C. §103(a) over Chikahisa in view of U.S. Patent No. 2,976,392 to Wabnitz. This rejection is respectfully traversed.

Claim 20 is allowable at least for its dependence on an allowable base claim. As such, withdrawal of this rejection is respectfully requested.

D. Claims 27 and 28 are added by this Amendment and recite that a stationary container further includes a body portion coaxial with a supplied portion and a stationary screw of a screw pump. This feature is shown in Fig. 21. These claims also have advantages

discussed in detail above. These claims are allowable at least for their dependence on allowable base claims.

## **II. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 4-7, 9-17 and 19-28 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

Stephen P. Catlin  
Registration No. 36,101

JAO:KXH/kzb

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**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

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